2006 Bloomington Environmental Quality Indicator (BEQI) Report

Executive Summary

January 8, 2007

The 2006 Bloomington Environmental Quality Indicator (BEQI) Report presents a snapshot of current environmental quality in our community and tracks trends in our environmental quality over time. The report is organized into six categories: transportation, energy, waste, air, water, and green infrastructure. One or more indicators of environmental quality are provided for each category. Data are provided at the scale of Bloomington when possible, although some data are available only at the aggregate scale of Monroe County. Each category of the report also includes background information and recommended actions for improving Bloomington's environmental quality. The BEQI report highlights the environmental progress Bloomington has made as well as areas still in need of improvement. It is intended to inspire critical thinking, community discussion, prioritization of environmental management efforts, and most of all, **action,** in order to ensure the environmental health of Bloomington for generations to come. We encourage Bloomington citizens, businesses and government to use the BEQI Report as a guide to how and where the city needs to improve its environmental quality. Summaries of the BEQI's main findings for each environmental category are provided below. The full report may be accessed at: www.bloomington.in.gov/

Transportation

Fossil fuel-powered transportation contributes to air and water pollution and global warming, and thus vehicle miles traveled, mode of commute to work, and bus ridership were selected as key indicators of environmental quality in the transportation category. According to the 2000 U.S. Census, two-thirds of Bloomington workers drove to work alone, while around 30% carpooled, walked, biked, or used public transportation. Bicycling increased by 32% from 1990 to 2000, but the portion of workers driving to work alone also increased and carpooling, walking and use of public transportation decreased over this time period. More recent trends indicate that public transportation is on the rise in Bloomington, with bus ridership increasing by 29% from 1999 to 2004.

Increased reliance on public transportation, walking and biking, and decreased single passenger vehicle trips would promote Bloomington's environmental and public health. The city should foster the former modes of transportation by continuing to expand its bike and pedestrian network and by promoting New Urbanism and smart growth development patterns.

Energy

Fossil fuels are also used to fulfill society's electrical and heating needs, with the same consequences for global warming and environmental pollution. Important energy-related environmental indicators therefore include electricity and natural gas consumption. Unfortunately, efforts to gather data relating to electricity and natural gas consumption in Bloomington have been challenging and such data are not currently included in the report. However, data on IU's energy use, largely fueled by coal, were available. Coal is the fossil fuel that produces the most pollution and the highest greenhouse gas emissions, while natural gas is the cleanest burning fossil fuel and has the lowest greenhouse gas emissions. Yet due to increased natural gas prices, the Indiana University Central Heating Plant (CHP) has increased coal consumption by 43% and decreased natural gas usage by 95% since 2000. Total IU electricity usage has increased 16% and consumption of electricity per student has risen 7% during the same time frame. Mandatory Clean Air Act regulations will come into effect in November 2007, and should result in reduced CHP emissions.

It is widely recognized that a dual strategy of increased energy efficiency/conservation and a shift to renewable energy sources is needed in order to move our society towards sustainable energy use. Indiana University and the City of Bloomington need to take a leadership role in this effort. Some examples of practical steps that citizens and others can take include switching from conventional light bulbs to compact fluorescent bulbs, enhancing insulation of homes and other buildings, buying energy-efficient appliances, and utilizing alternative energy sources such as geothermal, photovoltaics, and passive solar.

Waste

The amount of solid and hazardous waste a society generates is an indicator both of energy and resource use and environmental pollution. Total solid waste generated in Monroe County rose by nearly 50% between 1994 and 2004. The solid waste generated per person was 7 pounds per day in 2004 (3 pounds lower than in comparable Indiana counties). Some of this waste is recycled, however, and in Bloomington recycling has nearly doubled (to 23%) since the city program began in 1991. Likewise, the Monroe County Solid Waste Management District collects 5,000-6,000 tons of recyclables annually, while Indiana University recycles an additional 1,800 tons (25-30%) of its waste annually. Solid waste includes hazardous waste, such as electronic equipment, oil, paint, and batteries. In 2005, Monroe County diverted approximately 900,000 pounds of hazardous waste from conventional landfills, and some of this waste was recycled. Indiana University ships its hazardous waste (recently approx. 35 tons per year) to an incinerator in Arkansas. Reported toxic chemical releases in Bloomington have declined by 50% since 1995. Although several PCB superfund sites have been mitigated in Bloomington, a few troublesome areas remain and continue to threaten our natural environment, especially our natural aquatic systems.

Some key strategies to reduce solid waste are expansion of recycling efforts to include residential apartments, restaurants, bars, and other businesses; increased reliance on high-quality, long-lasting, recycled and/or reusable products; buying bulk food items and other products with minimal packaging; and composting of food scraps and yard waste. Bloomington citizens and businesses alike should also educate themselves about hazardous waste, seeking out non-toxic substitutes for hazardous products wherever possible and properly disposing of or recycling hazardous waste through the Monroe County Solid Waste Management District.

Air

The EPA recognizes two categories of air pollutants: criteria (carbon monoxide, sulfur dioxide, nitrogen oxide, ozone, lead, and particulate matter) and hazardous. Around 70% of criteria pollutants emitted in Monroe County come from motor vehicles. The most abundant pollutant is carbon monoxide (40,000 tons per year), of which 90% is due to vehicular exhaust. Since 1985, criteria emissions appear to have declined in Monroe County. During the years 1996 to 2001, for instance, total criteria pollutants declined by 6%. Better air quality can be attributed to the Clean Air Act and more stringent pollution control measures. Between 1997 and 2001, hazardous air pollutants from point sources declined by 43%. Non-road mobile source hazardous air pollution (e.g. from lawnmowers), however, has nearly doubled.

Since air quality is closely related to transportation and its accompanying noxious emissions, a significant decrease in private car use and a switch to more energy-efficient vehicles (e.g. hybrid cars) are desirable in order to further lower the burden of carbon monoxide and other air pollutants within Monroe County. Businesses and households can also contribute to cleaner air by seeking out less-polluting substitutes to dry cleaning and other solvents, paints, and degreasers.

Water

Fresh water quality and quantity is vital for drinking and bathing, irrigation, fisheries, and recreation among other services. Good indicators of the status of Bloomington's water resources are water quality reports and surface water assessments as well as data on water consumption. While over 70% of Bloomington waters support safe human contact, less than 30% of these waterways fully support aquatic life, and every water body in the city has some kind of impairment. Monroe Reservoir, which supplies Bloomington's drinking water, is only slightly impaired by Indiana Department of Environmental Management standards, but it is plagued by invasive species, as are Lakes Griffy and Lemon.

Strategies to improve water quality include planting green roofs and/or rain gardens, reducing or eliminating the use of pesticides and chemical fertilizers, and cutting down on fossil fuel use via alternative transportation, energy use efficiency, and conservation and use of renewable energy sources. Strategies to reduce water usage include installing low-flow shower heads, maximizing washing machine loads, landscaping with water-efficient native plants, and capturing roof runoff for irrigation.

Green Infrastructure

Buildings, roads and utilities provide essential services for modern human society, but underlying this man-made infrastructure is a natural, *green* infrastructure of life-supporting services provided by ecosystems. Key indicators of green infrastructure quantity and quality include greenspace, invasive plant species, and Backyard Wildlife Habitats. Bloomington is losing greenspace annually. Without preventative measures, most remaining greenspace not currently owned by the city or Indiana University is likely to be developed in the next 40 years. To combat this loss, Bloomington is actively acquiring available greenspace, such as the CSX rail corridor. Another threat to Bloomington's green infrastructure is invasive plant species such as Brazilian elodea, which has invaded Griffy Lake. The City of Bloomington works to eliminate invasive species and prevent their spread through mechanical, biological, and chemical control measures. Bloomington has sought to combat greenspace reduction and the appearance of non-native species by establishing Backyard Wildlife Habitats. The city is registered with the National Wildlife Federation as a Community Wildlife Habitat and has numerous homes, schools, and businesses that are certified individually. Over 100 sites in the city are certified, which is more than any other comparable Midwestern city.

Bloomingtonians can do their part to preserve quality green infrastructure by not planting non-native, invasive plant species in their gardens and yards, and by instead planting native species. It is also very important to adequately protect riparian areas by not allowing development infringement and/or the loss of vegetated buffers near creeks, stream, and rivers. Protection of riparian areas not only supplies habitat for aquatic and terrestrial species (green infrastructure), it also greatly aids in the reduction of pollution to our water supply.

Conclusion

The 2006 BEQI report presents a mixed picture of Bloomington's environmental quality. The overall snapshot shows that Bloomington is still very much entrenched in the industrial paradigm of the 20th century, with heavy dependence on fossil fuels and single vehicle transportation, high energy and resource use, alteration and loss of natural ecosystems by development, and participation in a "cradle-to-grave" flow of resources that ends by delivering profligate amounts of solid waste to landfills or by emitting waste in gaseous or aqueous form to air, water, or soil. This linear model has been repeated in city after city throughout the developed and developing world over the last 100

years, resulting in environmental degradation at local to global scales. Environmental regulations, such as the Clean Air and Water Acts, have helped to slow the rate of degradation. Yet collectively, humans have transformed nearly half of the Earth's habitable land to urban and agricultural systems, altered atmospheric chemistry, and accelerated rates both of species extinctions and invasions into previously unoccupied habitat. Thus, as we enter the 21st Century, humanity finds itself well into the 6th major extinction event in the history of life, at the threshold of global climatic change, and faced with a host of other major environmental problems -- soil erosion, air and water pollution and rapidly disappearing natural ecosystems.

There is increasing recognition, however, in Bloomington and around the world, that humans depend crucially on natural ecosystem processes for basic life support services such as air purification, climate regulation, waste decomposition, and essential consumable goods such as food, pharmaceuticals, and fresh water. Clearly humans are degrading the environment at risk to their own health and prosperity and that of future generations. Achieving a sustainable biosphere is arguably society's most pressing challenge and must become its organizing principle. To do this, cities will need to move away from the linear industrial model of the 20th century toward more cyclical, high efficiency "cradle-to-cradle" models that rely on renewable energy and integrate the built and natural environments in a mutually beneficial, cost-effective manner. The 2006 BEQI report shows that Bloomington is taking small steps toward this model. Encouraging trends include increased bicycling and bus ridership, increased recycling, decreased reported toxic releases, progress in clean up of PCB contamination, decreased air pollution, decreased water consumption and substantial participation in creating backyard wildlife habitats.

Much remains to be done, however, and there is a great need for action in every environmental category. Our city government has acknowledged this reality already with bold initiatives such as the formation of a Commission on Sustainability, signing on to the Mayor's Climate Protection Agreement, and city council resolutions in support of the Kyoto Protocol, a reduction of our community's greenhouse gas emissions, and future planning for oil scarcity. The 2006 BEQI report presents additional recommendations and concrete and commonsense steps that citizens, businesses and government can take to improve Bloomington's environmental quality and move Bloomington along the path toward sustainability. Our city is blessed with an aware and proactive citizenry, and numerous non-profit groups such as the Center for Sustainable Living and the new Caldwell Center for Culture and Ecology are already working to implement these actions. We are therefore confident that our special city is up to the challenge of sustainability, and expect that the next iteration of the BEQI report will see great strides taken toward improving Bloomington's environmental quality.

Bloomington Environmental Commission
January, 2007 (updated February 24, 2007)